No. 8000106

# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

## Northrup King Co.

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

COMMON WHEAT

'812'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington *this* 18th *day of* February *in the year of our Lord one thousand nine hundred and* eighty-two.

*Attest:*

*Commissioner*
*Plant Variety Protection Office*
*Grain Division*
*Agricultural Marketing Service*

*Secretary of Agriculture*

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, POULTRY, GRAIN & SEED DIVISION

# APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

**INSTRUCTIONS:** *See Reverse.*

FORM APPROVED
OMB NO. 40-R3822

No certificate for plant variety protection may be issued unless a completed application form has been received (5 U.S.C. 553).

| 1a. TEMPORARY DESIGNATION OF VARIETY | 1b. VARIETY NAME | FOR OFFICIAL USE ONLY |
|---|---|---|
| 75W 812 | 812 | PV NUMBER 8000106 |
| 2. KIND NAME: Common Wheat | 3. GENUS AND SPECIES NAME: Triticum aestivum | FILING DATE 5/9/80 / TIME 1:00 A.M. (P.M.) |
| 4. FAMILY NAME (BOTANICAL): Gramineae | 5. DATE OF DETERMINATION: June, 1976 | FEE RECEIVED $ 500.00 $ 250.00 / DATE 5/9/80 12/4/81 |
| 6. NAME OF APPLICANT(S): Northrup King Co. | 7. ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*: 1500 Jackson St. N.E. Minneapolis, MN 55413 | 8. TELEPHONE AREA CODE AND NUMBER: 612-781-5305 |

| 9. IF THE NAMED APPLICANT IS NOT A PERSON, FORM OF ORGANIZATION: *(Corporation, partnership, association, etc.)* | 10. IF INCORPORATED, GIVE STATE AND DATE OF INCORPORATION | 11. DATE OF INCORPORATION |
|---|---|---|
| Corporation | Delaware | 1896 |

12. NAME AND MAILING ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS:
Robert W. Romig
Northrup King Co.
P.O. Box 959
Minneapolis, MN 55440

13. **CHECK BOX BELOW FOR EACH ATTACHMENT SUBMITTED:**

- [X] 13A. Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- [X] 13B. Exhibit B, Novelty Statement.
- [X] 13C. Exhibit C, Objective Description of the Variety *(Request form from Plant Variety Protection Office.)*
- [X] 13D. Exhibit D, Additional Description of the Variety.

14a. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a). (If "Yes," answer 14B and 14C below.)* [ ] YES [X] NO

| 14b. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS? | 14c. IF "YES," TO 14B, HOW MANY GENERATIONS OF PRODUCTION BEYOND BREEDER SEED? |
|---|---|
| [ ] YES [ ] NO | [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED |

15a. DID THE APPLICANT(S) FILE FOR PROTECTION OF THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

15b. HAVE RIGHTS BEEN GRANTED THIS VARIETY IN OTHER COUNTRIES? [ ] YES [X] NO *(If "Yes," give name of countries and dates.)*

16. DOES THE APPLICANT(S) AGREE TO THE PUBLICATION OF HIS/HER (THEIR) NAME(S) AND ADDRESS IN THE OFFICIAL JOURNAL? [X] YES [ ] NO

17. The applicant(s) declare(s) that a viable sample of basic seed of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

May 5, 1980
(DATE)

Robert W. Romig
(SIGNATURE OF APPLICANT)

May 5, 1980
(DATE)

(SIGNATURE OF APPLICANT)

FORM GR-470 (1-78)

# INSTRUCTIONS

GENERAL: Send an original copy of the application and exhibits, at least 2,500 viable seeds, and $500 fee ($250 filing fee and $250 examination fee) to U.S. Dept. of Agriculture, Agricultural Marketing Service, Livestock, Poultry, Grain and Seed Division, Plant Variety Protection Office, National Agricultural Library Building, Beltsville, Maryland 20705. (See section 180.175 of the Regulations and Rules of Practice.) Retain one copy for your files. All items on the face of the form are self-explanatory unless noted below.

ITEM

5 Give the date the applicant determined that he had a new variety based on (1) the definition in section 41(a) of the Act and (2) the date a decision was made to increase the seed.

13a Give: (1) the genealogy, including public and commercial varieties, lines, or clones used, and the breeding method; (2) the details of subsequent stages of selection and multiplication; (3) the type and frequency of variants during reproduction and multiplication and state how these variants may be identified and (4) evidence of uniformity and stability.

13b Give a summary statement of the variety's novelty. Clearly state how this novel variety may be distinguished from all other varieties in the same crop. If the new variety most closely resembles one or a group of related varieties: (1) identify these varieties and state all differences objectively; (2) attach statistical data for characters expressed numerically and demonstrate that these differences are significant; and (3) submit, if helpful, seed and plant specimens or photographs of seed and plant comparisons clearly indicating novelty.

13c Fill in the Exhibit C, Objective Description form, for all characteristics for which you have adequate data.

13d Describe any additional characteristics that are not described, or whose description cannot be accurately conveyed in Exhibit C. Use comparative varieties as is necessary to reveal more accurately the description of characteristics that are difficult to describe, such as, plant habit, plant color, disease resistance, etc.

14a If "YES" is specified (seed of this variety be sold by variety name only as a class of certified seed) the applicant may NOT reverse his affirmative decision after the variety has either been sold and so labeled, his decision published, or the certificate has been issued. However, if the applicant specified "NO," he may change his choice. (See section 180.16 of the Regulations and Rules of Practice.)

15a See section 42 of the Plant Variety Protection Act and section 180.7 of the Regulations and Rules of Practice.

## EXHIBIT A

### Origin and Breeding History of the Variety

The wheat variety "812" is the product of hybridization and individual plant selection in the F2, F3 and F4 generations from the cross Oleson's Dwarf/Bison. Oleson's Dwarf is a semi-dwarf spring wheat from Rhodesia. Bison is a normal height, hard red winter wheat developed by the Kansas Agricultural Experiment Station. The pedigree of "812" is 790-6M-1N2N-OK.

We made the cross in the greenhouse in Minnesota in 1968 and grew the F1 in the greenhouse in 1969. We planted an F2 population from this cross at Marienthal, Kansas in the fall of 1969. The variety "812" is derived from individual plant selection in the F2, F3 and F4 generations made at Marienthal, Kansas in 1970 and at York, Nebraska in 1971-72. We grew the F5 row at Pratt, Kansas in the 1972-73 season. We harvested the F6 seed from this row as a bulk in 1973 and maintained the variety as a pure line by bulk increase at Pratt, Kansas in the 1973-74 and 1974-75 seasons during testing and evaluation. In 1975, we selected 100 heads, in what then corresponded to the F7 generation. We then planted this F8 seed in individual head rows at Yuma, Arizona in the 1975-76 season.

We noted segregation for reaction to false black chaff at this stage and so selected 33 of these rows which had a minimum expression of this characteristic for further increase and observation. These F9 families were then grown as individual plots at Yuma, Arizona in the 1976-77 season. We subsequently bulked nine of these plots based on their uniformity within and between plots to constitute breeders seed of the variety. The variety has been maintained as a pure line by bulk increases since then.

The false black chaff reaction is affected by imperfectly understood environmental conditions. We eliminated those head rows most severely affected by this characteristic to develop the variety. We have noted varying light degrees of expression of this characteristic both within and between locations such that we classify the variety as having a light tendency toward the expression of false black chaff.

The variety appears to be uniform and stable within the context of seed certification requirements. The Texas Crop Improvement Association inspected and passed foundation seed production in the 1978-79 season.

**EXHIBIT A (Addendum) 9/23/81**

**Origin and Breeding History of the Variety**

We do not consider the reaction to false black chaff to be a describable, genetic variant, and no other variants are recognized.

10/5/81

**EXHIBIT B - Revised 9/23/81**

**Novelty Statement**

The semi-dwarf, hard red wheat variety '812' is most like TAM 106 but differs from TAM 106 in reaction to soil-borne mosaic virus. Variety '812' is resistant to this disease whereas TAM 106 is susceptible.

FORM APPROVED. OMB NO. 40-R3712

FORM GR-470-6
(2-15-73)

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
GRAIN DIVISION
HYATTSVILLE, MARYLAND 20782

EXHIBIT C
*(Wheat)*

# OBJECTIVE DESCRIPTION OF VARIETY

## WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S)
Northrup King Co.

ADDRESS *(Street and No. or R.F.D. No., City, State, and ZIP Code)*
1500 Jackson St. N.E.
Minneapolis, MN 55413

FOR OFFICIAL USE ONLY
PVPO NUMBER 8000106

VARIETY NAME OR TEMPORARY DESIGNATION
812

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

**1. KIND:**

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

**2. TYPE:**

[3] 1 = SPRING 2 = WINTER 3 = OTHER *(Specify)* Intermediate

[2] 1 = SOFT 2 = HARD 3 = OTHER *(Specify)* _____

[2] 1 = WHITE 2 = RED 3 = OTHER *(Specify)* _____

**3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:**

[2][1][3] FIRST FLOWERING

[2][2][1] LAST FLOWERING

**4. MATURITY *(50% Flowering)*:**

[0][5] NO. OF DAYS *EARLIER* THAN . . . . . [7] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[ ][ ] NO. OF DAYS *LATER* THAN . . . . . [ ] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

7 = Centurk 9/30/81 ✓

**5. PLANT HEIGHT *(From soil level to top of head)*:**

[0][7][5] CM. HIGH

[ ][ ] CM. TALLER THAN . . . . . [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[1][8] CM. SHORTER THAN . . . . . [7] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

7 = Centurk

**6. PLANT COLOR AT BOOTING *(See reverse)*:**

[2] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

**7. ANTHER COLOR:**

[1] 1 = YELLOW 2 = PURPLE

**8. STEM:**

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[0][3] NO. OF NODES *(Originating from node above ground)*

[1][6] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

**9. AURICLES:**

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Hairiness: 1 = ABSENT 2 = PRESENT

**10. LEAF:**

[1] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER *(Specify)*: _____

[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[2] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[1][3] MM. LEAF WIDTH *(First leaf below flag leaf)*

[1][8] CM. LEAF LENGTH *(First leaf below flag leaf)*:

FORM GR-470-6 (REVERSE)

**11. HEAD:**

[3] Density: 1 = LAX 2 = DENSE 3 = Middense

[4] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER (Specify) Fusiform to long Oblong ® 9/30/81

[4] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[1] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER (Specify): _____

[0][8] CM. LENGTH [1][3] MM. WIDTH

**12. GLUMES AT MATURITY:**

[3] Length: 1 = SHORT (CA. 7 mm.) 2 = MEDIUM (CA. 8 mm.) 3 = LONG (CA. 9 mm.)

[3] Width: 1 = NARROW (CA. 3 mm.) 2 = MEDIUM (CA. 3.5 mm.) 3 = WIDE (CA. 4 mm.)

[2-3] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[3] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

**13. COLEOPTILE COLOR:**

[1] 1 = WHITE 2 = RED 3 = PURPLE

**14. SEEDLING ANTHOCYANIN:**

[1] 1 = ABSENT 2 = PRESENT

**15. JUVENILE PLANT GROWTH HABIT:**

[3] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

**16. SEED:**

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[5] Phenol reaction (See instructions): 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER (Specify) _____

[0][7] MM. LENGTH [0][3] MM. WIDTH [4][0] GM. PER 1000 SEEDS

**17. SEED CREASE:**

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[2] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

**18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)**

[2] STEM RUST (Races) 151 [2] LEAF RUST (Races) Unknown [0] STRIPE RUST (Races) _____ [0] LOOSE SMUT

[0] POWDERY MILDEW [0] BUNT [2] OTHER (Specify) Soil-borne mosaic ® 9/30/81

**19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)**

[0] SAWFLY [0] APHID (Bydv.) [0] GREEN BUG [0] CEREAL LEAF BEETLE

[ ] OTHER (Specify) _____ HESSIAN FLY RACES: [0] GP [0] A [0] B [0] C [0] D [0] E [0] F [0] G

**20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:**

| CHARACTER | NAME OF VARIETY | CHARACTER | NAME OF VARIETY |
|---|---|---|---|
| Plant tillering | Bezostaya 1 | Seed size | Bezostaya 1 |
| Leaf size | Sturdy | Seed shape | Bison |
| Leaf color | Sturdy | Coleoptile elongation | Unknown |
| Leaf carriage | Sturdy | Seedling pigmentation | Unknown |

## INSTRUCTIONS

**GENERAL:** The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

**LEAF COLOR:** Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

rec'd 5/9/80 1:00 pm

**EXHIBIT D** 8000106

**Additional Description of the Variety**

1. Botanical Description

The variety "812" is a cultivar of Triticum aestivum L. with intermediate growth habit. The kernels are free-threshing, red, hard, and elliptical. Kernel size is about 7 mm long and 3 mm wide. The germ is mid-sized. The cheeks are rounded to slightly angular with a mid-deep to deep crease. The brush is medium and not collared. The phenol reaction is black.

The spike is awned, fusiform to oblong, and middense to dense. Awns are 2-8 cm long. Glumes are white, long to midlong, wide to midwide with oblique to rounded shoulders. Under certain environmental conditions, glumes may exhibit symptoms of false black chaff. Spikes are 8 cm long and 13 mm wide based on measurements at Yuma, Arizona in 1977. Spike length and width, along with other measurements, will vary according to environment.

The coleoptile color is white and anthocyanin is absent in the seedling. Juvenile growth habit is erect. Plant color at booting is green. Waxy bloom is present on the stem and flag sheath. The auricles are hairy and lack anthocyanin.

The flag leaf is large in size and erect at booting. After booting, they become recurved and usually twisted. Anther color is yellow.

The variety "812" is a semi-dwarf wheat typically 2-5 cm shorter than Tam 101. The stems are strong and resistance to lodging is excellent. This is an early maturing wheat which heads about 23 days earlier than Tam 101.

2-3 days 10/5/81

The variety "812" is resistant to the races of leaf rust, Puccinia recondita Rob. ex Desm. prevalent in Texas in 1978. It is moderately resistant to race QSH (151) of P. graminis f. sp. Tritici Erikss. & Henn. (seedling infection type 2) and moderately susceptible (seeding infection type 3) to race TNMK (1520B). It is susceptible to Septoria tritici Rob. in Desm. and resistant to soil-borne mosaic virus. Reactions to other pests have not been catalogued.

The quality characteristics indicate it is a mellow gluten type.

This variety is adapted to the Southern Plains area of New Mexico, Oklahoma and Texas. It has poor winter hardiness and seldom survives the winter in Nebraska unless there is snow cover. It may survive mild winters in south Kansas.

Table 1. Heading Dates and Plant Height for Wheat Variety "812" Grown at Pratt, Kansas in 1975, 1976, & 1977

| Year/ Variety | Heading Date Days From Jan. 1 | Height cm |
|---|---|---|
| 1975 | | |
| Exp. 8D | | |
| "812" | - | 65 |
| Centurk | - | 75 |
| Tamwheat 101 | - | 70 |
| 1976 | | |
| Exp. 10 | | |
| "812" | 122 | 88 |
| Centurk | 127 | 103 |
| Tamwheat 101 | 122 | 88 |
| Exp. 24 | | |
| "812" | 116 | 88 |
| Centurk | 126 | 105 |
| Tamwheat 101 | 121 | 85 |
| 1977 | | |
| Exp. 90D | | |
| "812" | 123 | 70 |
| Centurk | 127 | 95 |
| Tamwheat 101 | 126 | 78 |
| Exp. 90I | | |
| "812" | 121 | 63 |
| Centurk | 129 | 93 |
| Tamwheat 101 | 125 | 75 |
| Average | (N=4) | (N=5) |
| "812" | 120.5 (S.D.=3.1) | 74.8 (S.D.=12.3) |
| Centurk | 127.3 (S.D.=1.3) | 94.2 (S.D.=11.9) |
| Tamwheat 101 | 123.5 (S.D.=2.4) | 79.2 (S.D.=7.3) |

Table 2. Milling and Baking Quality Comparisons for Wheat Variety "812" Grown at Pratt, Kansas in 1975

| | "812" | Centurk | Sturdy |
|---|---|---|---|
| Test wt. lb/bu | 60.0 | 60.0 | 61.0 |
| Protein % | 15.0 | 14.3 | 16.3 |
| Flour Extraction | 66.0 | 64.8 | 66.9 |
| Flour Ash | .338 | .355 | .390 |
| Farinograph Data | | | |
| Absorption | 63.0 | 60.0 | 62.4 |
| Peak | 7.5 | 8.5 | 8.8 |
| Stability | 19.0 | 26.0 | 20.5 |
| MTI | 25 | 25 | 20 |
| Valorimeter | 71 | 77 | 77 |
| Bake Mix Time | 3.75 | 5.75 | 3.75 |
| Loaf Volume | 935 | 855 | 1000 |
| Bake Score | 27 | 22 | 28 |
| Total Score | 54 | 46 | 56 |

Table 3. Milling and Baking Quality Comparisons for Wheat Variety "812" Grown in Northrup King Demonstration Strip Plots During the 1976-77 Season

| Characteristic | Howe, TX | | Beardwell, TX | | Seymour, TX | |
|---|---|---|---|---|---|---|
| | "812" | Sturdy | "812" | Sturdy | "812" | Tam 101 |
| Test wt. lbs/bu | 60.5 | 60.6 | 63.5 | 62.0 | 58.7 | 61.9 |
| Protein % | 11.1 | 10.9 | 13.5 | 13.9 | 12.2 | 12.4 |
| Extraction % | 70.7 | 71.2 | 71.1 | 70.0 | 71.3 | 65.5 |
| Farinograph Data | | | | | | |
| Absorption | 58.7 | 56.0 | 61.8 | 58.8 | 59.0 | 61.2 |
| Peak | 2.50 | 3.00 | 5.75 | 7.50 | 3.75 | 9.75 |
| Stability | 6.0 | 9.0 | 11.0 | 16.0 | 6.5 | 30.0 |
| MTI | 35 | 25 | 25 | 20 | 40 | 20 |
| Valorimeter | 51 | 59 | 65 | 71 | 56 | 81 |
| Flour Ash | .40 | .53 | .36 | .43 | .43 | .41 |
| Four Protein | 10.00 | 9.90 | 12.50 | 12.90 | 11.20 | 11.10 |
| Bake Absorption | 62.0 | 58.5 | 64.5 | 61.5 | 62.5 | 64.5 |
| Mixing Time | 3.3 | 3.0 | 3.3 | 3.8 | 3.3 | 4.5 |
| Dough Characteristics | 3 F- | 4 F | 5 G | 6 G | 4 F | 5 G- |
| Loaf Volume cc | 780 | 850 | 895 | 990 | 795 | 850 |
| Loaf Grain | 5 G- | 5 G- | 5 G- | 5 G- | 4 F | 4 F |
| Loaf Texture | 4 F | 4 F | 5 G- | 5 G- | 5 G | 5 G |
| Crumb Color | 97 | 97 | 97 | 97 | 97 | 97 |
| Bake Score | 20 | 22 | 25 | 29 | 21 | 25 |
| Total Score | 42 | 44 | 53 | 57 | 44 | 52 |

Table 4. Milling and Baking Quality Comparisons for Wheat Variety "812" Grown in Northrup King Demonstration Strip Plots During the 1977-78 Season

| Characteristic | Oceola, TX | | Temple, TX | Howe, TX | | Aquilla, TX | |
|---|---|---|---|---|---|---|---|
| | "812" | Sturdy | "812" | "812" | Sturdy | "812" | Sturdy |
| Test wt. lbs/bu | 58.2 | 59.1 | 57.1 | 60.5 | 60.3 | 60.5 | 61.9 |
| Protein % | 16.1 | 16.1 | 14.5 | 12.0 | 12.0 | 10.7 | 12.2 |
| Extraction % | 66.9 | 68.8 | 69.3 | 72.2 | 70.7 | 72.1 | 71.4 |
| Farinograph Data | | | | | | | |
| Absorption | 63.4 | 61.6 | 62.0 | 58.0 | 56.4 | 57.0 | 58.4 |
| Peak | 9.50 | 13.00 | 8.75 | 7.00 | 7.00 | 2.00 | 11.00 |
| Stability | 15.0 | 22.0 | 13.5 | 18.0 | 13.5 | 16.5 | 25.0 |
| MTI | 15 | 25 | 20 | 20 | 25 | 25 | 25 |
| Valorimeter | 77 | 87 | 74 | 70 | 67 | 57 | 83 |
| Flour Ash | .63 | .64 | .48 | .39 | .49 | .40 | .46 |
| Flour Protein | 14.8 | 14.9 | 13.4 | 11.0 | 11.0 | 9.7 | 11.2 |
| Bake Absorption | 67.0 | 65.0 | 65.0 | 61.5 | 58.5 | 60.0 | 61.5 |
| Mixing Time | 3.5 | 3.5 | 3.5 | 4.0 | 4.0 | 2.25 | 5.0 |
| Dough Characteristics | 6 G | 6 G | 5 G- | 5 G- | 5 G- | 2 P | 5 G- |
| Loaf volume cc | 975 | 1000 | 880 | 860 | 865 | 670 | 830 |
| Loaf Grain | 5 G- | 5 G- | 5 G- | 4 F | 5 G- | 2 P | 5 G- |
| Loaf Texture | 5 G- | 5 G- | 5 G- | 5 G | 4 F | 2 P | 5 G- |
| Crumb color | 96 | 96 | 96 | 97 | 97 | 97 | 97 |
| Bake score | 29 | 31 | 26 | 25 | 25 | 10 | 28 |
| Total Score | 55 | 58 | 52 | 52 | 51 | 30 | 57 |

Table 4. (continued)

| Characteristic | Aquilla, TX "812" | Lampasa, TX "812" | Dimmitt, TX "812" | Dimmitt, TX Tam 101 |
|---|---|---|---|---|
| Text wt. lbs/bu | 60.2 | 57.2 | 62.9 | 59.5 |
| Protein % | 12.3 | 15.7 | 14.5 | 14.6 |
| Extraction % | 71.7 | 68.7 | 68.9 | 63.4 |
| Farinograph Data | | | | |
| Absorption | 61.0 | 64.0 | 63.2 | 64.4 |
| Peak | 7.00 | 8.50 | 5.00 | 7.50 |
| Stability | 14.5 | 11.5 | 6.50 | 13.0 |
| MTI | 15 | 25 | 45 | 30 |
| Valorimeter | 69 | 71 | 54 | 70 |
| Flour Ash | .39 | .51 | .44 | .40 |
| Flour Protein | 11.3 | 14.5 | 13.3 | 12.9 |
| Bake Absorption | 64.0 | 67.5 | 66.0 | 68.0 |
| Mixing Time | 3.00 | 3.00 | 2.3 | 3.0 |
| Dough Characteristics | 4 F | 6 G | 3 F | 5 G- |
| Loaf Volume cc | 780 | 990 | 725 P | 885 G- |
| Loaf Grain | 4 F | 4 F | 2 P | 5 G- |
| Loaf Texture | 4 F | 4 F | 2 P | 5 G- |
| Crumb Color | 97 | 96 | 96 | 96 |
| Bake Score | 21 | 27 | 12 | 26 |
| Total Score | 48 | 53 | 33 | 51 |

*State of Delaware*

# *Office of the Secretary of State*

I, EDWARD J. FREEL, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF AMENDMENT OF "NORTHRUP KING CO.", CHANGING ITS NAME FROM "NORTHRUP KING CO." TO "NOVARTIS SEEDS, INC.", FILED IN THIS OFFICE ON THE THIRTIETH DAY OF DECEMBER, A.D. 1996, AT 9 O'CLOCK A.M.

A CERTIFIED COPY OF THIS CERTIFICATE HAS BEEN FORWARDED TO THE NEW CASTLE COUNTY RECORDER OF DEEDS FOR RECORDING.

GREAT SEAL OF THE STATE OF DELAWARE • 1793 • 1847 • 1907 •

LIBERTY AND INDEPENDENCE

*Edward J. Freel, Secretary of State*

0829320 8100

960389892

AUTHENTICATION: 8267947

DATE: 12-31-96

CERTIFICATE OF AMENDMENT OF CERTIFICATE OF INCORPORATION

OF

NORTHRUP KING CO.

It is certified that:

1. The name of the corporation (hereinafter called the "Corporation") is Northrup King Co.

2. The Certificate of Incorporation of the Corporation is hereby amended by striking out Section 1 thereof and by substituting in lieu of said Section the following new Section.

1. The name of the Corporation is Novartis Seeds, Inc.

3. The amendment of the certificate of incorporation herein certified has been duly adopted and written consent has been given in accordance with the provisions of Sections 228 and 242 of the General Corporation Law of the State of Delaware.

4. The effective date of the amendment herein certified shall be January 1,1997.

Signed on December 27, 1996.

Edward C. Resler
Vice President & Secretary